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EXPLORATION AND TRAVEL.

New Explorations in Central Africa.

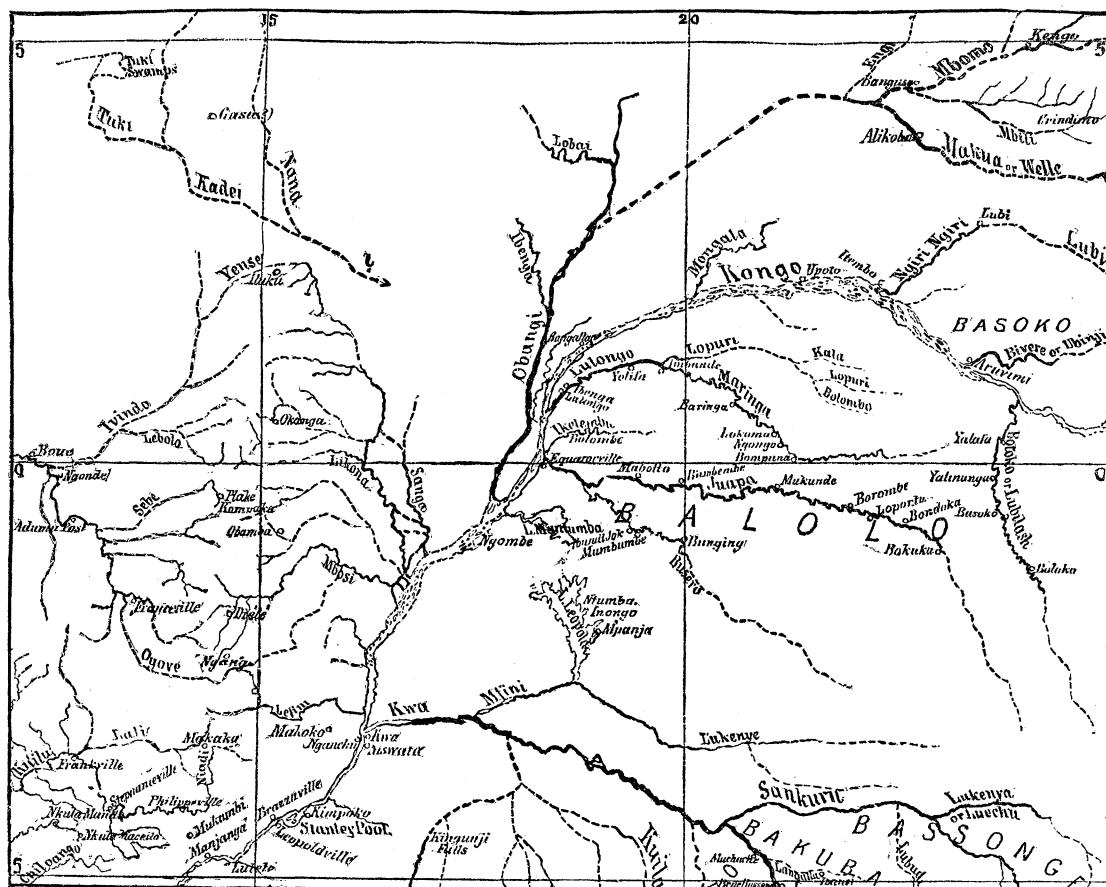
THE progress of explorations in the Kongo Basin is so rapid that our map of May 27 does not fully correspond to the present state of our knowledge. Therefore we reproduce in the present number the part in which the most important discoveries have been made, corrected to date. The Mongala and the tributaries of the Obangi are drawn more accurately from new maps published by the *Mouvement géographique*, but the most remarkable features of the new map are the discoveries of Giacomo de Brazza in the region between the Obangi and Ogove, which were published in the Bulletin of the Italian Geographical Society. Though it is more than a year since this traveller returned from his journey, the map has been published only now, but as it is not based on the longitudes of Captain Rouvier, the positions had to be corrected accordingly. De Brazza started from the upper Ogove. First he made several short excursions in the region between the upper Ogove and the

the *Mouvement géographique* that Captain van Gèle has ascended the Lopuri, the tributary of the Lulongo. The upper part of this river runs in a north-westerly direction, and approaches the Kongo closely in longitude $21^{\circ} 26'$. Then it takes a south-westerly course. The parallelism of these rivers with the Kongo explains the absence of tributaries in the central part of its upper course.

HEALTH MATTERS.

Pasteur's Methods.

RECENT criticisms of the inoculation-method of Pasteur for rabies have been very unfavorable; but the report of the English Committee will undoubtedly turn the tide again in the opposite direction. It will be remembered that this committee was appointed by the President of the Local Government Board, in April, 1886, to inquire into Pasteur's treatment of this disease. Its report has just been presented to Parliament. The value of such a report depends en-



MAP SHOWING LATEST INFORMATION ON THE KONGO BASIN.

Alima, and then started on his important journey. He left Madi-ville on July 12, 1885, travelling in a north-easterly direction. He crossed the Sebe farther north than this river was supposed to run, and crossed the water-shed between the Likona and Ogove under the equator. The most northern point reached is Iluku, situated in a densely populated region. He indicates that this region belongs to the drainage area of the Ogove, the Ivindo rising near this place. This is an important discovery, as it considerably enlarges the drainage area of the Ogove. De Brazza returned to the Kongo by way of the Likuala. Close to the mouth of this river, a little farther east, the Sanga, which according to von François carries a great volume of water, empties. Therefore it must drain an extensive area. As the western tributaries of the Obangi are of no great importance, and the tributaries of the Ogove extend so far east, we must suppose that its sources lie far north, and it may be that the rivers Kadei and Nana, which have been described to Flegel by the natives, are its upper course.

Since the accompanying sketch-map was engraved, we learn from

tirely upon the qualifications of those who form the committee, and we presume, that, composed as it is of some of the most eminent of English investigators, its conclusion will receive the most respectful and careful consideration by the scientific world. The report is signed by James Paget, Chairman ; T. Lauder Brunton, George Fleming, Joseph Lister, Richard Quain, Henry E. Roscoe, I. Burdon Sanderson, and Victor Horsley. We venture to say that no more eminent committee was ever appointed on such an investigation.

In the course of its inquiry the committee visited Paris to obtain information from Pasteur himself, and to observe his method of treatment. They investigated a considerable number of persons inoculated by him. Mr. Horsley conducted a careful series of experiments on the lower animals, and entirely confirms Pasteur's discovery of a method by which they may be protected from the infection of rabies. The committee states that "it may be deemed certain that M. Pasteur has discovered a method of protection from rabies comparable with that which vaccination affords against infection from small-pox. It would be difficult to over-estimate the im-

portance of the discovery, whether for its practical utility or for its application in general pathology." The committee investigated ninety cases treated by Pasteur. Of this number, twenty-four had been bitten on naked parts by undoubtedly rabid dogs, and the wounds were not cauterized, nor otherwise treated in any way likely to have prevented the action of the virus. Of thirty-one that were bitten, there was no clear evidence that the dogs were rabid, and in others the bites had been inflicted through the clothes. It is estimated, from experience of the results of bites in other cases, that, had they not been inoculated, not less than eight among these ninety persons would have died. Not one of them has shown since the inoculation any signs of hydrophobia. The committee thinks it certain that the inoculations practised by M. Pasteur have prevented the occurrence of hydrophobia in a large proportion of those who, if they had not been so inoculated, would have died of that disease. And his discovery shows that it may become possible to arrest by inoculation, even after infection, other diseases besides hydrophobia.

If rabies be not reduced among the dogs of England, there will always be a large number of persons who will require treatment. The average annual number of deaths from hydrophobia during the ten years ending 1885, was, in all England, 43; in London alone, 8.5. These numbers may be taken as representing only five per cent of the persons bitten, so that the preventive treatment will be required for 860 persons in all England, and for 170 in London alone.

In commenting on this report of the committee, the London *Lancet* says that "their verdict is the most important yet pronounced upon the subject, and must go far to decide the question of the prophylactic value of the inoculation of Pasteur. The conclusion that the method has saved a considerable number of lives, and that it is at present, and probably will be for long, the only mode of saving from death those who have been bitten by a rabid dog, affords strong support to Pasteur's conclusions, and, we need hardly say, must have most important practical results."

MEASLES.—The prevalence of measles in some parts of the world, and its fatality, have aroused health-authorities to such an appreciation of the necessity for restricting the spread of this disease, that official steps are being taken for the attainment of this end. A recent occurrence at Portsmouth, England, makes the necessity for this work more emphatic. H. M. S. Crocodile arrived at that place with forty persons sick with measles on board, who were permitted to land. From these individuals the disease has spread to an epidemic, and at last reports the number of deaths was one hundred and ninety-seven.

LEPROSY IN LOUISIANA.—Considerable excitement has been occasioned in Louisiana by the report that leprosy existed at St. Martinsville in that State. The State Board of Health has made an examination, and finds that five persons are suffering from undoubted leprosy, while three others are as yet in doubt.

BOOK-REVIEWS.

Chance and Luck: a Discussion of the Laws of Luck, Coincidences, Wagers, Lotteries, and the Fallacies of Gambling; with Notes on Poker and Martingales. By RICHARD A. PROCTOR. London, Longmans, Green, & Co.

THE persistency of a superstition can generally be referred to the subtleness and persuasiveness of the logic upon which it is founded, or to the fact that it appeals to a strong instinct in human nature. Doubtless both these influences have been at work in keeping alive, among those in whom the hazarding instinct is at all strong, a fondness towards a belief in their own favoritism, in the obscure forces which control luck, and in the sundry other agencies which go to make of chance something which is more than chance. For the benefit of such,—and they form a respectable portion, both in size and ability, of mankind,—Mr. Proctor has written this book. He hopes to be able to convince a few of the errors of their ways, sadly recognizing "that the gambling fraternity will continue to proclaim their belief in luck, . . . and the community on whom they prey will, for the most part, continue to submit to the process of plucking, in full belief that they are on their way to fortune."

The wide-spread belief in luck is in many ways easy to account

for, and even to defend. There is an element of chance that enters in the lives of every one of us; and it is but natural that where this chance favors the success of our projects,—though not the least to our credit,—this should have a decided influence in the shaping of our character. Much that is attributed to good fortune is really good common sense and wise forethought; but, allowing for that, as long as there remains this element of uncertainty in our lives, it is evident that there must be certain individuals who are lucky, in the sense that they have been fortunate when they had no very good reason to expect success, and certain others who have been unlucky under the same circumstances. But this, Mr. Proctor well insists, is a very different thing from the common conception of a lucky individual, which regards such a man as more likely to be fortunate in success depending entirely on chance, in the future; as a chosen being for whose benefit the laws of probabilities will be suspended, and who can, even with considerable confidence, count upon such benign intervention. It is this conception that has the strongest hold upon gamblers, upon the wisest and sharpest of them, as well as upon the people at large, and is a very ridiculous and a very dangerous superstition. If some way could be devised by which the expectation, the subjective feeling of confidence, could be properly proportioned to the mathematical chance of securing the desired prize, lotteries could no longer exist, and the chance forms of gambling would appear as utter folly. The methods by which such occupations are carried on are devised to carefully prevent any such enlightenment, and they easily succeed in so doing.

The logic of the matter is very simple. Take lotteries as an example. If ten persons each deposit five dollars, and agree that the one throwing the highest number of points with a pair of dice shall receive the fifty dollars, that would be a fair lottery. To test its fairness, we have simply to consider, that, if one person bought all ten deposits, he would be sure to win, and would neither lose nor gain: in other words, mathematically the price to be paid for a share in a lottery is obtained by dividing the amount that can be gained by the number of shares. No lottery of this sort would pay: hence no paying lottery is fair, and every lottery that exists pays those who control it very well indeed. The Louisiana lottery, the peculiarity of which Mr. Proctor characterizes as 'the calm admission, in all advertisements, that it is a gross and unmitigated swindle,' sells monthly 100,000 tickets at five dollars each. Deducting from the \$500,000 thus received as much as \$10,000 for expenses, and a similar amount for 'the charitable and educational purposes' for which the State sanctions the lottery, there remain \$480,000. Instead of distributing all this in prizes, they distribute only \$265,000; and thus, when all the tickets are sold,—and few are ever left,—the managers have a clear profit of forty-five per cent per month. This is exactly the same kind of swindling as would be committed by the man who invited the ten persons to deposit their five dollars, were he to give the one who threw the highest number of points \$26.50, and quietly pocket the \$23.50 as a reward for his trouble. Lotteries exist and pay, because people are willing to give more for the chance of securing a prize than they ought to give. They dwell frequently and long on the immensity of the prize, entirely underestimating the slightness of the possibility of their securing it, and thus cherish a sort of optimism which overlooks barefaced robbery and tolerates the most glaring frauds. That such is the case was experimentally demonstrated by the English Government. Tickets for a lottery were offered for sale, not at a fixed price, but for what they would fetch. The contractors bought of the government tickets mathematically worth £10 at £16, and again sold the tickets at a large advance. The public was perfectly willing, and actually asked, to be plundered.

Gambling-banks and the superstitions of gamblers offer a still more interesting topic. Here there is often much ingenuity displayed in arranging plans by which apparently fortunes must be won, and in defending pet notions with an array of apparently sound argument. But the reason why a bank must win has often been exposed. It is simply that it reserves for itself, under certain conditions (apparently very unlikely), a certain sum, apparently small, or it stakes a larger sum at exaggerated odds for the great probability of winning a small fee. Thus the *refait in rouge et noir*, which apparently is a most improbable event, must, by the doctrine